Seal

Description

[0001] The invention concerns a sealing element comprising at least one housing area, at least one dynamically active sealing area and at least one statically functioning sealing area which at least partially interacts with the housing area.

[0002] The DE-A 40 18 216 introduces a wave seal containing a lip seal ring made of polytetrafluorethylene or another related material, with a radial hip forming a lip seal as well as an axial hip on the outer perimeter. The wave seal contains a housing having a static seal area, which is composed of sealing lacquer, in the area of the receptacle aperture.

[0003] A wave seal Is seen in US-A 2,889,163 having a housing area, a dynamic seal area, as well as a static seal area. The static seal area is planned to be in the radial external perimeter of the housing area, and is formed as a layering of minimal radial thickness. The layering is composed of thermoplastic material such as acrylic, vinyl, phenol or similar materials.

[0004] It is generally understood that seal elements having a static seal area are themselves to be provided by various elastomers having varying profile shapes.

[0005] The fundamental problems of the state-of-the-art are essentially founded on the reduction of installation effort through use of thinner friction surface layers, but these have the drawback that they also reduce the necessary functional strength under operational conditions, so that in suboptimal cases the seal element may move out of its receptacle mounting.

[0006] Static seals on the basis of elastomers are frequently difficult to implement due to high installation and remount effort required.

[0007] This invention addresses the task of furthering the work of the first patent claim in this business area of seal elements in such a manner that installation processes will be simpler, and exhibit sufficient staying power under operational conditions.

[0008] This requirement is addressed by the static seal area being at least partially covered in a specified proportion of friction-reducing elements and hardenable materials.

[0009] Advantageous further developments of the invention are cited in the subordinate claims.

[0010] Installation effort can be reduced as a result of the friction-reducing properties of installing elements in hardenable materials The advantageous effect under temperature influence of hardenable covering on the static seal area take effect after initial operation of the seal element, increasing the essential staying power, so that movement of a seal element out of its assigned receptacle mount can surely be avoided.

[0011] It is advantageous when this material is also a glue, such as polymeric material. Polyurethane and polyacrylate are suitable here.

[0012] PTFE or similar material can be used here as friction-reducing material for elements.

[0013] A preferred composition of hardenable materials is provided as follow:

Acrylic polymer	5 – 10%
PTFE	0 – 10%
Water	65 – 95%

[0014] One further thought relative to the invention is that the seal element be formed of a radial wave seal ring, with a perimeter surface, specifically the external perimeter surface, is typically formed of elastomer material as a static seal area. The static seal area can be, for example, also be designed in a profiled form, where the cover includes at least the tip area of the profile.

[0015] Besides radial wave seal rings, the invention can also be applied for axial sliding seal rings with corresponding static seal areas, but also be used in LAUFWERK seals, insofar as these are equipped with appropriately formed housing components, having assigned static seal areas.

[0016] The advantageous installation of layering on the elastomer interior and/or exterior perimeter of the radial wave seal ring increases the staying power of the radial wave seal ring in the area of the receptacle aperture, so that higher operational security level can be achieved over the useful operational life of the seal element. Beyond that the installation effort is significantly reduced, which is of benefit where multiple installations are required.

[0017] As previously stated, increases in the staying power may be realized through reaction of the layering under influence of temperature increases in operational conditions. It is also conceivable that a layering material, specifically a glue, may be used where the cold temperature is affected by the installation process, resulting in hardening from the friction heat generated during installation.

[0018] The invention object is represented in an execution example in a drawing, and is described as follows. The drawing depicts:

[0019] Page 1: Principal sketch of a radial wave seal ring

[0020] Page 2: Principal sketch of a partial view of a sliding ring seal

[0021] Figure 1 shows a radial wave ring seal (1) containing a housing area (4) consisting of two sheet metal bodies (2, 3), a static seal area (5) in the form of an elastomer layer on the external surface (6) of the sheet metal body (2), as well as a dynamic seal area (7), made out of PTFE, for example, working in relation to the supplemental seal lip (8) made up of the elastomer material used for the static seal area (5). The static seal area (5) includes wave profile (9) in this example, wherein the external perimeter (10) of the wave profile (9) has a covering (11), which in this example is formed by a glue material that is hardenable by the effect of temperature. The glue material should consist of this composition for purposes of the example: 10% acrylic polymer, 5% PTFE and 85% water. The static seal area is to be mounted in the housing area (12), which is only indicated, and not depicted, while the dynamic seal area (7) and the rotating wave area (13) have a functional work relationship to each other. Given the proportional utilization of

PTFE within covering area (11), an easier installation of the radial wave seal ring (1) into the receptacle aperture (12) can be achieved. Under operational conditions, when the environmental temperature of the receptacle aperture (12) increases, the glue material will harden, resulting in at least a partial connection of the perimeter surface area (14) with the receptacle aperture (12), resulting in increased staying power.

[0022] Along with greater ease of installation, brought about by use of friction-reducing elements, a not insubstantial increase in the staying power is brought about, so that movement of the radial wave seal ring (1) out of the receptacle aperture (12) can surely be inhibited.

[0023] Figure 2 depicts a partial view of an axial sliding ring seal (15).
That item contains a sliding ring (16) with a dynamic sliding surface (17), an external surface area comprising a housing area for receiving a static seal area (19) made of an elastomer material. The static seal area (19) works in conjunction with a receptacle aperture that is not depicted, and is coated with a covering material (20) made of hardenable glue material to make installation easier, that covering material has the same or similar properties as covering area (11) in accordance with Figure 1.